

## Motorcycle Saddlebag

### BACKGROUND

The invention relates to motorcycle saddlebags.

### SUMMARY

5 The present invention provides a motorcycle saddlebag. The saddlebag includes a body, a lid, and a hinge assembly interconnecting the body and the lid. The body has an inner surface defining a cavity. The lid has an inner surface and is movable between an open position and a closed position. When in the open  
10 position, the lid does not fully cover the cavity, but when in the closed position, the inner surface of the lid defines an upper boundary of the cavity, and the lid fully covers the cavity. The hinge assembly includes a first mounting member mounted to the inner surface of the body, a second mounting member mounted to the inner surface of the lid, and a coupling assembly pivotally coupling the first  
15 and second mounting members to each other. The hinge assembly is completely enclosed within the cavity when the lid is in the closed position.

The hinge assembly may further include first and second coupling members pivotally coupled between the first and second mounting members by way of pins. The first and second coupling members are preferably substantially  
20 identical to each other. Preferably there are four pins establishing a four bar linkage within the hinge assembly. Due to the four bar linkage configuration, the lid moves in a substantially vertical translational fashion at least until the lid substantially entirely disengages the body, and then moves in a substantially pivotal fashion with respect to the body.

At least one of the lid and body may have a chrome plating adhered to its external surface and at least one of the lid and body is preferably constructed of an ABS/polycarbonate blend.

Preferably, a body lip is integrally injection-molded with the body and defines a mouth of the cavity. A gasket may be positioned on the body lip and a lid lip may be mounted to the lid. The gasket is sandwiched between the lid lip and the body lip when the lid is closed. The lid lip is preferably manufactured separately from the rest of the lid and is preferably glued to the lid. The lid lip preferably includes an undercut that rests on the edge of the lid, and the lid preferably has internal gussets to give additional support to the lid lip.

A gas spring may be employed to bias the lid toward the open position. A locking mechanism may also be used to lock the lid in the closed position.

Other features and advantages of the invention will become apparent to those skilled in the art upon review of the following detailed description, claims, and drawings.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a side view of a motorcycle with a saddlebag embodying the current invention.

Fig. 2 is a section view of the saddlebag illustrated in Fig. 1.

Fig. 3 is an enlarged view of the rear portion of the motorcycle illustrated in Fig. 1.

Fig. 4 is a section view taken along line 4-4 in Fig. 3 showing the saddlebag in a slightly opened position.

Fig. 5 is an enlarged exploded perspective view of the hinge assembly of the saddlebag.

Fig. 6 is an enlarged section view of the saddlebag hinge in the fully closed position.

Fig. 7 is an enlarged section view of the saddlebag hinge in a partially opened position.

5 Fig. 8 is an enlarged section view of the saddlebag hinge in a fully opened position.

Fig. 9 is an enlarged view of the saddlebag latching mechanism in a closed position.

10 Fig. 10 is an enlarged view of the saddlebag latching mechanism in an opened position.

Before one embodiment of the invention is explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of the components set forth in the following description or illustrated in the drawings. The invention is capable of other  
15 embodiments and of being practiced or being carried out in various ways. Also, it is understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. The use of "including" and "comprising" and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. The use of  
20 "consisting of" and variations thereof herein is meant to encompass only the items listed thereafter. The use of letters to identify elements of a method or process is simply for identification and is not meant to indicate that the elements should be performed in a particular order.

## DETAILED DESCRIPTION

Fig. 1 illustrates a motorcycle 10 including a frame 14, a front wheel 18, a rear wheel 22 and a seat 24. A rear fender 30 extends rearwardly of the seat 24 and is disposed substantially over the rear wheel 22. A saddlebag 34 is removably mounted aside the rear fender 30. The saddlebag 34 includes a body 38, and a lid 42 pivotally coupled to the body 38. The body 38 and/or the lid 42 are preferably injection-molded from an ABS/polycarbonate blend and one or both of the lid 42 and body 38 is preferably chrome plated; however, any suitable materials, fabrication methods, and finishes may be used in constructing the saddlebag 34.

Referring now to Figs. 2 and 3, the body 38 includes an inner surface 43 defining an upward-opening cavity 44. The lid 42 includes an inner surface 45 and is movable between a closed position (shown in solid lines in Fig. 3), and an open position (shown in phantom in Fig. 3). When the lid 42 is in the closed position, the inner surface 45 fully closes the cavity 44 and defines an upper boundary thereof. When the lid 42 is moved to the open position, the inner surface 45 separates from the inner surface 43, opening the cavity 44 and allowing items to be easily inserted into or withdrawn from the saddlebag 34. The saddlebag 34 also includes a hinge assembly 46, a gas spring 50 interconnected between the lid 42 and the body 38, and a locking mechanism 54 selectively interconnecting the lid 42 to the body 38 as will be discussed in more detail below.

Referring now to Fig. 4, the body 38 includes an integrally formed body lip 58. The body lip 58 defines a mouth 62 of the cavity 44 and supports a gasket 66. The lid 42 includes a lid lip 70 having an undercut 74. The undercut 74 is positioned on an edge 78 of the lid 42. The lid 42 also includes gussets 82 further

supporting the lid lip 70 to reduce shear stresses on the lid lip 70. The lid lip 70 is preferably glued to the inner surface 45 of the lid 42. When closed (Figs. 3 and 6), the lid lip 70 engages the gasket 66 along a joining perimeter around the entire mouth 62 of the cavity 44.

5 Referring now to Fig. 5, the hinge assembly 46 includes a first mounting member 90 mounted to the body 38, a second mounting member 94 mounted to the lid 42, a first coupling member 98, and a second coupling member 102. The first coupling member 98 and the second coupling member 102 are substantially identical to each other and are both pivotally coupled to both mounting members  
10 90, 94. In this regard, the coupling members 98, 102 form a coupling assembly 106.

The first mounting member 90 includes a first pair of mounting bosses 110 supporting a first pin 114, and a second pair of mounting bosses 118 supporting a second pin 122. The first and second pins 114, 122 are substantially parallel to  
15 each other and are spaced apart a first distance L1. The second mounting member 94 includes a third pair of mounting bosses 126 supporting a third pin 130 and a fourth pair of mounting bosses 134 supporting a fourth pin 138. The third and fourth pins 130, 138 are substantially parallel to each other as well as to the first and second pins 114, 122. The third and fourth pins 130, 138 are spaced apart a  
20 second distance L2 different from the first distance L1. The second distance L2 is preferably larger than the first distance L1. The first coupling member 98 is pivotally coupled to both the first and third pins 114, 130, and the second coupling member 102 is pivotally coupled to both the second and fourth pins 122, 138. The hinge assembly 46 is therefore a four-bar linkage between the body 38 and the lid  
25 42.

Referring now to Figs. 6-8, the hinge assembly 46 is characterized by an instantaneous pivot axis 142 about which the lid 42 pivots. The pivot axis 142 is located by defining a first plane 146 extending through the longitudinal axes of the first and third pins 114, 130, and a second plane 150 extending through the longitudinal axes of the second and fourth pins 122, 138. The intersection of the first and second planes 146, 150 defines the pivot axis 142 of the saddlebag lid 42. The planes 146, 150 diverge from each other an angle  $\theta$ . The angle  $\theta$  represents the effective angle between the first coupling member 98 and the second coupling member 102.

When the lid 42 fully is closed (Fig. 6), the pivot axis 142 is a maximum distance from the hinge assembly 46 and the angle  $\theta$  has a minimum value. As the lid 42 begins to open (e.g. position 154 in Fig. 3 and that illustrated in Fig. 7), the angle  $\theta$  increases and the pivot axis 142 moves closer to the hinge assembly 46. Because of the large distance between the pivot axis 142 and the hinge assembly 46 when the lid 42 first begins to open, the lid 42 disengages the body 38 in a substantially vertical translational motion (see arrow in Fig. 7). As the lid 42 continues to open, the angle  $\theta$  continues to increase and the distance between the pivot axis 142 and the hinge assembly 46 continues to decrease resulting in a transition from substantially translational motion to substantially rotational motion (see arrow in Fig. 8) of the lid 42 with respect to the body 38. When the lid 42 is in the fully open position (e.g. position 158 in Fig. 3 and that shown in Fig. 8), the angle  $\theta$  has a maximum value and the distance between the pivot axis 142 and the hinge assembly 46 has a minimum value. Closing the lid 42 results in a similar transition from substantially rotational motion to substantially translational motion

such that when the lid 42 once again engages the body 38, it does so in a substantially vertical translational motion.

Due to the configuration of the hinge assembly 46, as the lid 42 is closed and opened, substantially the entire lid lip 70 respectively engages and disengages substantially the entire gasket 66 instantaneously along the joining perimeter of the saddlebag 34. As a result, there is substantially no localized pinching of the gasket 66 by the lid lip 70 and wear on the lid lip 70 and gasket 66 is significantly reduced

Referring now to Figs. 9 and 10, the locking assembly 54 of the saddlebag 34 selectively secures the lid 42 in the closed position, and is operated by a lockable push button 162. The push button 162 is slidably coupled to, and has a portion located outside of, the body 38. The locking assembly 54 also includes a latch 164 mounted to the lid 42. A hook 166 is pivotally coupled to the push button 162 by a pin 170, and a cam mechanism 174 is pivotally coupled to the saddlebag body 38. When the lid 42 is closed the locking assembly 54 is in a first position (Fig. 9) wherein the cam mechanism 174 engages the latch 164.

Depressing the push button 162 causes the hook 166 to pivot about the pin 170 and engage the cam mechanism 174, moving the cam mechanism 174 to a second position (Fig. 10) and releasing the latch 164 such that the lid 42 may be moved toward the open position. The cam mechanism 174 then remains in the second position to receive the latch 164 when the lid 42 is closed. When the lid 42 is moved to the fully closed position the latch 164 engages the cam mechanism 174, returning it to the first position and securing the saddlebag lid 42 in the closed position. The push button 162 may be locked against actuation with a key (not shown) to lock the lid 42 in the closed position.

Returning to Fig. 2, the gas spring 50 biases the lid 42 toward the open position (see 158 in Fig. 3). When the lid 42 is closed, the hinge assembly 46, the gas spring 50, and the locking assembly 54 (except for the push button 162) are contained within the cavity 44 and are completely hidden from view. The  
5      saddlebag 34 may be opened by unlocking the push button 162 with the key (if necessary) and simply depressing the push button 162 to release the latch 164. The lid 42 is then moved toward the fully open position under the influence of the gas spring 50 alone.